INTERIM REPORT

ON THE

INVESTIGATION INTO THE

GRAND COULEE FIRE

Rick McCullough, Fire Commissioner
Department of Community Services

Randy Sentis, Assistant Deputy Minister
Environmental Protection & Enforcement Division
Department of Environment and Public Safety

November 29, 1991

92-01761/

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1.0 INTRODUCTION

1.1 At approximately 5:00 p.m. on Wednesday, November 20, 1991, a fire occurred at a warehouse located south and west of Grand Coulee. The warehouse was being used as a transfer facility as part of the province's Agricultural Chemical Collection Program (ACCP) and contained a variety of waste agricultural chemicals. In addition, a smaller quantity of waste laboratory chemicals were at the facility.

1.2 Emergency response to the fire was provided by the Grand Coulee Fire Department, the RCMP, and the Regina City Fire Department. Also on site were representatives from Saskatchewan Environment and Public Safety, the provincial Fire Commissioner's Office, the provincial Emergency Measures Organization (EMO), SPMC, and the owner of the facility. Due to the nature of the facility the decision was made to allow the fire to burn. By approximately 11:00 p.m. that evening the fire had burned itself out.

1.3 At a news conference on November 21, 1991, the Hon. Carol Carson announced that she had appointed Randy Sentis, Assistant Deputy Minister of Saskatchewan Environment and Public Safety, and Rick McCullough, provincial Fire Commissioner to head up an inquiry into the fire.

The Minister directed her officials to:

- Determine what happened, how the fire started, what was in the

warehouse, and how efficiently the emergency response system worked.

- Conduct an environmental assessment of the damage which may have been done, short term and long term, as a result of the fire.
- Evaluate the Agricultural Chemical Collection Program to see if the collection, transportation and storage of waste chemicals is being done in the best possible manner.
- Make any recommendations for future control procedures which might be useful to ensure such a situation does not arise again.

1.4 This report represents only the initial results of the various investigations and activities presently underway. The recommendations contained in Section 8 are those which the investigators felt required follow-up action prior to the release of the final report.

It should also be noted that the priority of the investigation to this point was to deal with the immediate issues of the environmental and fire investigations and to provide site security and initiate containment and cleanup of the property.

Priority in the weeks ahead will focus on the broader questions raised by this incident.

2.0 SITE HISTORY

2.1 The warehouse is located approximately one half mile south and west of the Village of Grand Coulee. It is owned by Ron Perrault who lives in a farm home east of the site. The facility is leased by Saskatchewan Property Management Corporation (SPMC) for use by Saskatchewan Environment and Public Safety as a transfer station for use in the ACCP and the Institutional Chemical Collection Program (ICCP).

The site was selected in 1976 by the Department of Government Services as a storage site for pesticides which had been purchased by the Department of Agriculture. One of the chemicals, Endrin, was subsequently delisted by the federal Department of Agriculture and was therefore no longer approved for use. There were no provincial environmental regulations in place at that time dealing with either hazardous substances storage or hazardous waste storage. Subsequently, regulations were developed for hazardous substances storage but hazardous waste storage regulations were still in the draft stage at the time of the fire.

When Saskatchewan Environment & Public Safety set up the ICCP in 1985, Government Services, in response to a request for a temporary storage site, arranged for the Department to share the use of this building. When the ACCP was set up in 1989 the lease was transferred from Agriculture to Environment

and Public Safety. It should be noted that one of the first activities of the ACCP was to repackage and ship the Endrin for proper disposal. This was the only site used by the Department as a transfer station in the ACCP.

2.2 At the time of the fire, staff of the Department were preparing for shipment the final load of chemicals which were collected during 1991. Appendix 10.1 contains a listing of the chemicals contained in the warehouse on November 20, 1991.

3.0 THE INCIDENT

At 1717 hours on November 20, 1991, the Grand Coulee Fire Department received a call to the Ron Perrault property. This initial alarm indicated smoke was coming from the building located most westerly on the owner's property indicated as burn site on the attached drawing (Appendix 10.2).

The Grand Coulee Fire Department was on the site by 1725 hours. The initial size-up was made by the local Fire Chief Maurice Revet. His knowledge of the structure and the materials stored in the building led to the decision not to attempt to extinguish this fire. The application of water would only complicate the situation. Many of the chemicals stored in this building were reactive to water and the application of water would only intensify the fire rather than extinguish it. Also, applying large volumes of water would cause further migration of the contamination from the original site resulting in a much larger and more difficult cleanup situation. Perhaps the most significant result from allowing the fire to burn freely was the incineration of the chemicals involved. The fire was reduced to a smouldering state by 2200 hours.

One member of the Grand Coulee Fire Department arrived on the scene at 1725 hours with his cellular phone. Under the direction of the local fire chief calls were placed to outside agencies for mutual aid. The Regina Fire Department was contacted and provided immediate response. They arrived on the scene at

1810 hours. They confirmed allowing the fire to burn was the proper decision. Using Regina Fire Department radios a command post was established upwind of the burning building with a communication centre set up at the Grand Coulee School. The school also served as a focal point for the media and all public information releases were handled from this location. The RCMP were contacted at 1745 hours and were on scene quickly to control traffic and carry out the subsequent decisions to evacuate farm homes downwind and reroute traffic on the Trans Canada Highway. Contacts were made with Saskatchewan EMO and Regina 911 at this time.

The fire was also reported through the 1-800 Spill Control Line by the property owner Mrs. Perrault. This resulted in the dispatch of Saskatchewan Environment and Public Safety representatives to the scene. While enroute, the Regina Fire Department, Saskatchewan Emergency Measures Organization and co-workers were contacted. They arrived on the scene shortly after 1800 hours and identification of the building contents were made available to the Fire Chief. They had been in the building earlier in the day and had a current inventory of what was in the building and where it was located. Again, the decision not to extinguish the fire was reinforced. The actual inventory is identified in Appendix 10.1 of this report.

The Fire Commissioner's Office was contacted by Regina 911 Dispatch and had

a representative on site by 1925 hours. A representative from the Saskatchewan Property Management Corporation was also on the scene at this time.

A precautionary evacuation was ordered by the Mayor of Grand Coulee at 2145 hours. Residents were allowed to return home by midnight.

Conclusion

It must be mentioned that Grand Coulee did not have a formal emergency response plan in place to deal with emergencies of this nature. However, initial actions resulting in no injuries or loss of life indicates some informal preplanning had been conducted by the local fire department. The department was aware this facility could present a particular hazard should a fire occur and discussion how it would be handled had taken place. Their quick response, initial size up and immediate action prevented any injury or loss of life to both response personnel and people in the area. In general the emergency response by all personnel was very effective.

This incident has provided Saskatchewan Emergency Measures Organization an opportunity to evaluate the effectiveness of community response under an actual incident. This organization has undertaken the evaluation of each response agency and will provide information to address any weaknesses identified. This information will be reflected through recommendations made in the final report.

4.0 ENVIRONMENTAL INVESTIGATION AND ASSESSMENT

4.1 Environmental Investigation

As the result of the fire, the following measures have been taken to determine the possible environmental damage to Mr. Perrault's farm yard and the surrounding area:

Thursday, November 21 - Ten snow samples were taken in the area downwind of the site in the afternoon and delivered to the Saskatchewan Research Council Laboratory in Saskatoon. Initial analytical results from the Saskatchewan Research Council laboratory confirmed the absence of cyanide, organo-chlorine and phenoxy acid.

Friday, November 22 - In a teleconference with Environment Canada officials in the morning, Saskatchewan Environment and Public Safety requested their assistance in: a) providing an "on-site" mobile laboratory and technician with the capability to do Microtox toxicity measures; and b) sending a team of experts from Ottawa to help the investigation team with advice on site entry, sampling program and clean-up measures.

The site was roped off by Saskatchewan Environment and Public Safety staff in the afternoon and has been secured since 4 p.m. by a contracted security firm on a 24 hour basis.

The mobile laboratory unit arrived at the site later in the afternoon.

A meeting was held in the evening with federal and provincial officials to discuss strategy for a sampling program and an entry program.

Saturday, November 23 - In the morning, the area was surveyed by the investigation team. During their survey, both snow and ash samples were taken near and around the perimeter of the burned facility for the Microtox scanning test. While waiting for the Microtox results of these samples, seven nearby farm houses were surveyed and a total of 19 wipe test samples were collected. Both inside and outside samples were taken.

At noon, the preparation for the first entry to the building was completed. Environment Canada specialists, Drs. Merv Fingas and J. Pare entered the burned area, with a provincial Fire Prevention officer, for the first time, after the fire, in totally-encapsulated suits. The survey revealed no toxic gases and innocuous radiation level. This inspection also showed that the site was burned much heavier than expected and that there was only a small amount of ash remaining. Most drums of pesticides have BLEVE'd (Boiling Liquid Expanding Vapour Explosion) and are empty. Only one full drum was found. Very little of the structure was left. Several areas of the ground to the east of

the building are lightly covered with pesticide spray resulting from the BLEVE's. No residues were found inside the building structure.

The analysis of the aggregate sample collected showed negative result for cyanide. At about 3:00 p.m. Environment Canada specialists re-entered the contaminated site to collect ash samples at various spots around the perimeter and some soil samples from discoloured area. Eight samples collected from this entry along with 17 wipe samples were brought back to Ottawa for laboratory analysis.

Saskatchewan Environment and Public Safety staff established surveyed transects south-east of the site for the preparation of soil sampling at the same time.

Sunday, November 24 - Another series of farm yard surveys and wipe sampling was done early in the morning. Seven houses were visited and 17 samples were collected. Interviews with residents from this and previous surveys confirmed the path of the plume.

Forty-two soil samples were collected in the morning by Saskatchewan Environment and Public Safety following the previously surveyed locations.

It should be noted that the storage shed less that 12 feet from the building somehow escaped unscathed. In order to determine the condition of this shed, which could be used as future command centre for the clean up operation, Environment Canada team inspected the shed and collected wipe samples. Microtox testing results indicated contamination inside the shed.

Additional farm yards (eight) were surveyed in late afternoon and 19 wipe samples were taken. Like the previous surveys, no soot depositions were noted. However four of the residents complained about the smoke and smell. This round of surveying included a farm over 20 km downwind, south of Rowatt.

Monday, November 25 - Saskatchewan Environment and Public Safety collected samples from dugouts in the areas. The samples were sent to the Saskatchewan Research Council (SRC) for analysis.

4.2 Preliminary Site Assessment

Extent of Contamination

Based on the laboratory results to date and evidence of coloration any contamination of concern is probably confined to the Perrault property. Much of this is readily cleanable.

The evidence to date indicates that no toxins, be they pesticides, pesticide breakdown products or pesticide combustion products or any other chemicals exist outside of the Perrault property. This is based on visual observations on exterior structures on properties downwind as far as 12 kms. No soot or colorations indicative of pollution have been observed.

All analytical results obtained to date are included in Appendix 10.3 of this report. A number of samples are still awaiting analyses and information on these will be available as it is received. Discoloration of soil adjacent to the warehouse and some splotches on soil and on the utility pole on the Perrault property indicate contamination by heptachlor and by trifluorolin. This is not severe and can be removed.

The warehouse is relatively free of residues and unburnt chemicals. In fact, there are areas where it is clear that there is none if any contamination. All this awaits chemical analysis of the little residue that was found. Only two areas exist where tarry residue was found - both residues were removed to the extent possible as laboratory samples.

Priority Areas for Investigation

The warehouse was given a preliminary assessment as to the extent of burned-off material and presence of residues. Because access is restricted due to

structural integrity and the corresponding safety concerns, three areas of concern were not fully assessed:

- The north-east corner of the warehouse where bulk pesticides were stored. The outer drums are empty, but the drums just inside the wall are still inaccessible.
- The two lab-pack or bulk drumming storage areas. These are the areas where the laboratory chemicals were stored. The drums appear to be integral, but whether they are or not is not known. This could only be determined by opening each drum.
- The fate of the material in the North-west corner. This material, not of high priority, is entirely covered with vermiculite.

5.0 FIRE INVESTIGATION

Investigation into the cause and origin of this fire began immediately. The fire investigation team, consisting of a local fire department representative, a member of the RCMP General Investigations Services and two inspectors from the Fire Commissioner's Office, was established. This team concept is consistent with most fire investigations undertaken by the Fire Commissioner's Office.

Immediate access to the building was restricted due to the remaining heat and unknown properties of the chemical residues. However, photographs were taken, site drawings were prepared and interviews with witnesses began.

In order to investigate the fire it is necessary to recreate the scene prior to the incident taking place. To do this required the review of building drawings as well as interviews of all people who were involved with activities that took place in the time preceding, during and immediately after the fire. This is especially important when the fire causes such severe damage and destroys many of the indicators necessary to determine the cause. The first step for the fire investigation was to determine the point of origin. Statements from witnesses indicating parts of the structure which were hot to the touch, the point where fire first burned through the structure and areas of most intense heat help locate the point of origin. However, it should be noted this is not

always conclusive because fuel loads within the structure burn differently, which could skew the results. In this case the fire investigation team believes the point of origin to be somewhere about midway along the east side of the structure . Further investigation requires the identification of what material was first ignited and what the ignition source was.

The fire investigators were allowed first access to the building on Saturday, Novembe 23, 1991. This provided little information. It was apparent that most equipment, the building itself and materials exposed to the fire had been heavily damaged. Determining materials first ignited and the ignition source will be difficult. All known possible causes of ignition have to be identified and eliminated one by one. In this case the pilot light on the natural gas furnace and electricity were identified as possible ignition sources. The Gas and Electrical inspectors were on the site Tuesday, November 26, 1991 to determine if these may have caused or contributed to the occurrence of the fire. There is no definite findings from these efforts.

Conclusion

Initial results from the investigation are inconclusive at this time. The investigation will continue until all possible causes have been identified and verified or eliminated. The investigation team is continuing interviews and reinterviews of people involved. Further investigation at the scene will

require the removal of portions of the building structure to ensure the safety of investigations and clean-up crews. It is anticipated this will occur within the next couple of days. Additional information will be provided as it develops.

6.0 CLEANUP

Following the completion of the initial assessment of the fire scene situation and sampling for downwind impacts by Provincial and Federal officials on Sunday November 24, 1991, a preliminary site assessment report and a suggested cleanup was provided by Dr. Merv Fingas of Environment Canada. This information is provided within Appendix 10.4 since it formed the essential direction and requirements for the cleanup plans which follow. Please refer to the Priority Cleanup Suggested section within Appendix 10.4 for further information with respect to the suggested cleanup actions.

Items 1 and 2 in Dr. Fingas' report, i.e.: the cleanup of soil areas affected by pesticide spray, are to be dealt with in one of three manners depending on the conditions and space restrictions encountered at the site. Department personnel have removed the upper contaminated layer of soil from the east-west access road by hand broom on Tuesday November 26 to determine the efficacy of the technique. Samples collected and tested using the Microtox system shows that sweeping to remove surficial pesticide spray was indeed an effective technique. Removal of the larger areas of soil from the contaminated area immediately surrounding the building was to be completed using a Highways Department road sweeper. Initially it appeared that the power sweeper would function satisfactorily however, the technique failed because of ground conditions and accumulation of excessive amounts of soil which the

sweeper could not handle satisfactorily. It will be necessary to employ a bladed implement to remove the upper soil layer. This work is planned for the morning of Thursday, November 28, 1991 with an anticipated completion date of Friday November 29, 1991. The only possible further requirement may be the hand removal of weeds from certain areas. Contaminated soil will be stored in drums or a larger waste lugger for eventual transport and disposal through Laidlaw Environmental Services under the existing ACCP contract.

Clean-up of the shed immediately south-east and adjacent to the former warehouse is planned for Thursday and Friday, November 28 and 29 and SPMC officials have been asked to secure the services of an industrial cleaning company for this task. This will be accomplished first by using high efficiency vacuum cleaners followed by re-establishment of power and gas to the building so it may be heated. Once heated the recommendations of Dr. Fingas may be acted upon.

With respect to the actual cleanup of the warehouse itself plans have been formulated, contractors are being contacted and materials have been ordered for the completion of this task.

A demolition contractor was contacted on Tuesday, November 26, 1991 to assist with the task of lifting and dissembling the remnants of the building, these

primarily being the structural elements and metal siding. An initial inspection of the facility by the demolition contractor, Saskatchewan Environment and Public Safety and SPMC was performed on the morning of Tuesday, November 26, to estimate the complexity of the job to follow. The demolition contractor was confident that the structural elements of the job would present no exceptional difficulties. The continuing fire investigation will necessitate that as structural elements are removed, fire inspectors must first examine the exposed areas for any remaining evidence. Saskatchewan Environment and Public Safety personnel will then provide expertise for handing of chemical related debris and any chemical repackaging as necessary. SPMC is presently securing the services of the demolition contractor as well as resolving insurance issues associated with the remediation of the site. Resolution of these issues is critical to the proposed scheduled target of December 18, 1991 for completion of initial warehouse remediation schedule. It must be noted that the disposal of any surviving chemicals and soil must await sampling, testing as well as both company and provincial approval, however no difficulties in this area are presently anticipated.

The remediation will proceed in a stepwise fashion from one end of the building to the other working from the upwind direction. Steel elements of the building will be removed, disassembled and tested for contamination using the Environment Canada on-site laboratory facilities. Those portions of the

actual structure of the building found to be safe will be disposed through steel recyclers while those which are contaminated will be stockpiled to await cleaning following the clearing of the major portions of the structure. The use of a steam cleaner is contemplated rather than high pressure soap and water due to cold temperatures at the site. If necessary, a small temporary structure can be assembled for washing of these materials. The Environment Canada laboratory will be employed to determine the degree of contamination of other fire debris. Contaminated non-metallic debris will be packed in barrels for disposal by Laidlaw under the existing ACCP contract. Areas of the floor found to be affected will be treated according to Dr. Fingas' Report recommendations. Drums have been ordered some of which have been delivered at the site as of Wednesday, November 27, 1991.

With respect to a control point to limit the possible spread of contamination by footwear, an initial system was established on Saturday, November 23 by the fire officials. A 26 X 10 Ft. Highways Department construction trailer arrived on site late Wednesday to function as a formal site office and control point. Furnishings and wash-up facilities are to be provided by SPMC. The trailer will initially be located to the North-east of the site. The trailer should be fully functional by Friday, November 29. Provincial Occupational Health and Safety representatives have been consulted with respect to both chemical related and demolition related safety concerns. The required safety equipment has been

ordered since most of Environment's supplies were destroyed during the fire. It is the Department's intent to complete the site cleanup as soon as possible in the safest possible manner.

7.0 COMMUNICATIONS

7.1 Historical Communications

When the Agricultural Chemical Collection Program (ACCP) was announced in 1989, staff of the Department met with representatives of both the R.M. of Sherwood and the Village of Grand Coulee to advise them of the Department's intent to use the building as a transfer station for chemicals collected under the program.

In addition, information on the site was included in the press release and press conference conducted by the Minister of Rural Development, and the information was broadcast on television news at the time.

SEPS supplied building owner Ron Perrault with a monthly updated list of chemicals in the warehouse awaiting shipment.

Even though information on use of the site had been supplied through the media and to the municipal governments, some residents of Grand Coulee and area were not aware of the building's purpose at the time of the fire.

7.2 On-Site Communications

At the time of the fire, immediate communications were coordinated by the Regina Fire Department, which was in charge of emergency response and

established a media information centre on-site.

7.3 Press Conference

The Minister held a press conference on November 21, the morning after the fire. She told the media that the night before she had appointed a two-person inquiry board to investigate the fire, conduct an environmental assessment, evaluate the ACCP, and recommend future control procedures to ensure such a situation would not arise again.

The Minister's remarks included an up-to-the minute report on actions taken at the scene and background information on the use of the building and the ACCP. In addition, she supplied media representatives with a list of chemicals being stored in the warehouse.

The Minister stressed the belief of department officials that the smoke's toxicity level was not dangerous and that the site was not a threat to the health of the local community.

7.4 News Releases

SEPS issued three news releases to the media to keep the public informed of the inquiry's progress. The news releases are contained in Appendix 10.5. In addition, on November 29 the Department is releasing this report with a news

release.

7.5 Letters to Residents

Inquiry Board members sent three information letters to the residents of Grand Coulee and area giving them up-to-date information on the progress of their investigation and encouraging them to call with their questions and concerns. This report is also being delivered to area residents.

Stewart Nicks, Grand Coulee Village Clerk, organized hand delivery of these communications to all residents in Grand Coulee and to farm families in the affected area. Copies of the letters are contained in Appendix 10.5.

7.6 Media Contacts

Inquiry Board Members, department officials and the Minister have made every effort to be accessible to the media and answer any questions they might have. Staff of the departments responded to approximately 250 media inquiries in the days between the fire and the release of the report.

8.0 INDEPENDENT STUDY OF THE AGRICULTURAL CHEMICAL COLLECTION PROGRAM

8.1 One of the directions received from the Minister was to:

> *"Evaluate the Agricultural Chemical Collection Program, to see if the collection, transportation and storage of waste chemicals is being done in the best possible manner."*

8.2 The Department has entered into an agreement with William Neff of William A. Neff Consulting Inc. of Ottawa to carry out the required study. Mr. Neff has had a wide range of experience including five and a half years as Division Chief, Petroleum and Organic Chemicals, Environmental Protection Division, Environment Canada and twelve years as Vice-President, Technical Affairs of the Canadian Chemical Producers Association. Mr. Neff is a graduate of the University of Saskatchewan (1959) with a degree in Chemical Engineering.

8.3 Mr. Neff's report is scheduled to be completed to allow it to be included as part of the final inquiry report.

9.0 RECOMMENDATIONS

9.1 The follow-up recommendations cover only those areas that the inquiry felt should be acted on prior to the release of the final report.

9.2 Site Security

Continuous security should remain at the site until:

a) The Fire Commissioner's Office have completed their investigation.

b) All residual contamination has been removed from the site.

c) Demolition work on the structure has eliminated any safety hazards.

9.3 Waste Regulations

The Department of Environment and Public Safety must give priority to the completion of "hazardous waste regulations."

9.4 Existing Hazardous Chemical Storage Sites

The Department of Environment and Public Safety should follow-up with the owners of these sites requesting them to:

a) evaluate the safety practices and procedures in place at their facility;

b) identify and rectify any deficiencies in the handling and storage of hazardous chemicals;

and the Department should also review with the owners the requirements of the Hazardous Substances Regulations.

9.5 Site Cleanup

Cleanup of the site should be carried out on a priority basis.

9.6 Site Monitoring

Once the site cleanup is complete a further monitoring program should be completed to confirm the effectiveness of the cleanup.

APPENDIX 10.1

GRAND COULEE CHEMICAL WAREHOUSE - CHEMICAL INVENTORY

The following is a summary of chemicals within the Grand Coulee Warehouse on November 20, 1991.

Pesticides:

50 - 205 Litre drums of bulked waste liquid herbicides and insecticides comprised of 41 drums of bulked chemicals and 9 drums of container rinsing water generated through the container cleaning process. A complete listing of the waste pesticides comprising the total of 50 drums is attached.

4 - 205 Litre drums (Labpacks) of waste pesticides solids. These are the solids from the bottoms of containers received during the ACCP which must be handled and packaged apart from the liquids. A complete listing of the materials within these labpacks is attached.

1 - 205 Litre drum (Labpack) of waste pesticide contaminated disposable coveralls, disposable gloves, and absorbent generated through the waste liquid pesticide activities. A complete listing of the materials within this labpack is attached.

Miscellaneous Pesticides:

Heptachlor:	2 - 205 Litre drums
	1 - 105 Litre drum
	1 - 23 Litre pail.
2,4-D	2 - 205 Litre drums
	2 - 23 Litre pails
Treflan	1 - 205 Litre drum
Lazer	3 - 23 Litre pails
Carbyne	1 - 4 Gallon pail
Endrin	1 - 4 Gallon pail
Carbofuran	2 - 23 Litre pails
Supracide	2 - 105 Litre drums
Avadex BW	4 - 23 Litre pails
Rinse Water	1 - 30 Litre pail

Approximately 250 rinsed pesticide pails and plastic jugs of 10 litre size or greater.

R. Perrault's Pesticides:

Carbyne 4 - 4 Gallon pails
Avadex BW 8 - 50 Pound Bags

Laboratory Chemicals:

4 - 205 Litre drums (Labpacks) of waste air and water reactive laboratory chemicals. This includes materials such as sodium metal, potassium metal, calcium metal, magnesium, calcium carbide and other materials. A complete listing of the materials within these labpacks is attached.

1 - 205 Litre drum (Labpack) of waste cyanide salts collected from school laboratories. This drum was approximately 1/2 full. A complete listing of the materials within this labpack is attached.

1 - 205 Litre drum (Labpack) of waste compressed gases collected from hospital laboratories and the ACCP. This drum was approximately 1/4 full. A complete listing of the materials within this labpack is attached.

2 - 22.7 Litre Labpacks of phosphorus. The actual total amount of phosphorus would not exceed 3 Kgs.

16 - 22.7 Litre pails of paint solids.

1 Kg. - Radioactive rock ore from school laboratories.

2 - Empty Transformer casing, outer drum casing only. These were recovered from the Langham landfill site.

Miscellaneous Working Materials and Supplies:

2 - 25 Kg. Bags of granular activated charcoal.

8 - 25 Kg. Bags of hydrated lime.

6 - 25 Kg. Bags of citric acid powder.

2 - 25 Kg. Bags of Soda Ash.

1 - 10 Litre container of gasoline.

10 - 25 Kg. Bags of Zorb-all absorbent.

100 - 205 Litre empty drums (approximately).

35 - 205 Litre empty overpack drums.

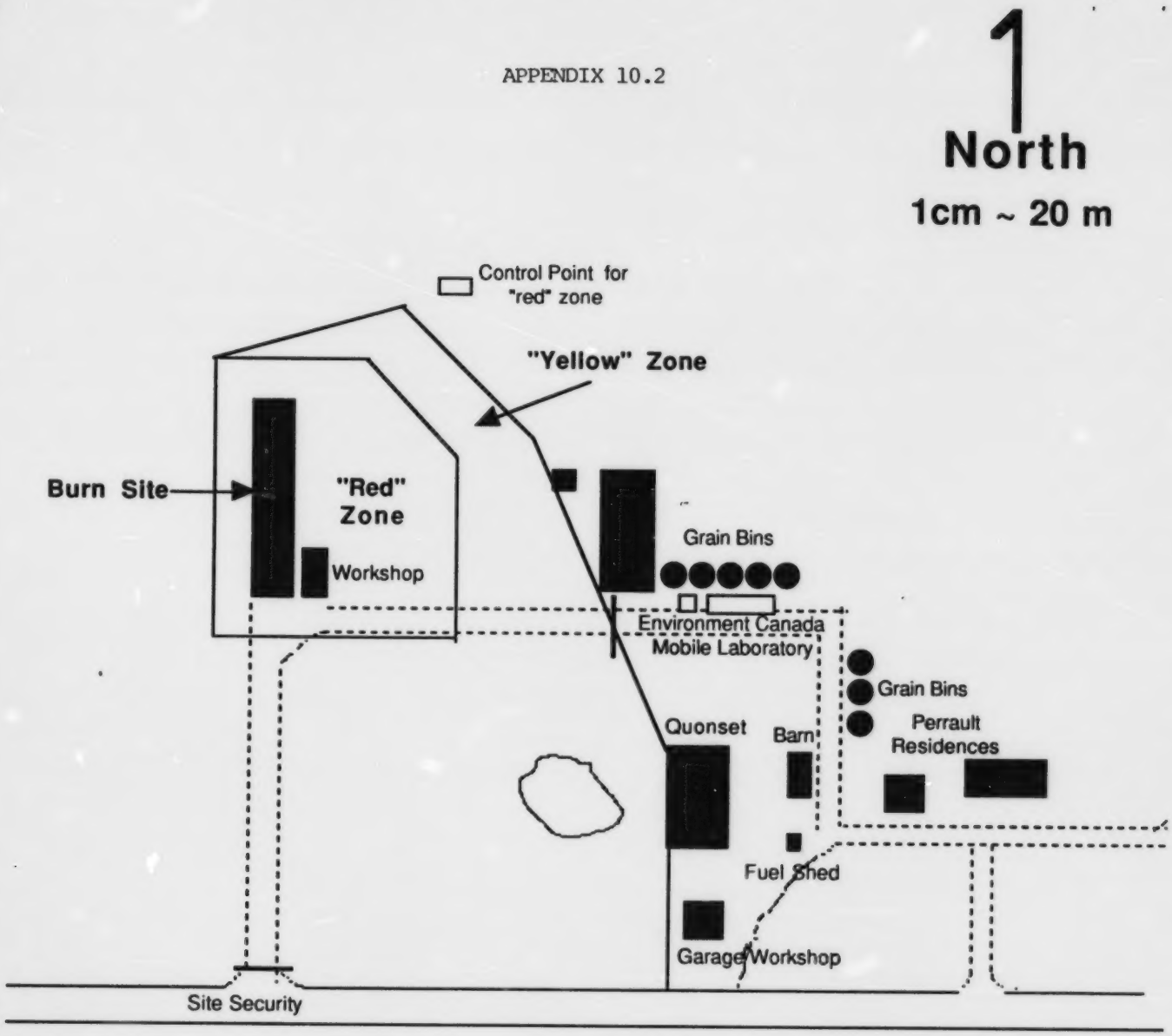
200 - Wooden Pallets.

Various Working supplies including: respirators, chemical resistant suits, gloves, tools, small empty pails, pallet jack, stationary supplies, etc.

SUMMARY OF CONTENTS OF LIQUID BULKED PESTICIDES

41 of the drums of bulked waste liquid pesticides were comprised of a mixture of the following herbicides and insecticides awaiting disposal. 2,4-D, Triallate, Trifluralin, Dicamba, Bromoxynil, Barban, Dieldrin, Endrin, Diclofop-methyl, MCPA, Carbaryl, Propanil and DDT comprised the bulk pesticides.

APPENDIX 10.2



"Red" Zone - Initial Cleanup Area

"Yellow" Zone - Subsequent Cleanup Area

General Layout of Perrault Farm

APPENDIX 10.3

Summary of Snow Sample Analysis

All values are in µg/l (parts per billion) unless otherwise stated.

Control

	Cyanides	Herbicides	Pesticides
C1 (Walter Scott Grounds)	2	<1	<1
C2	21	<0.20	<0.05

Grand Coulee Access Road

	Cyanides	Herbicides	Pesticides
A2	<1	<0.20	<0.05
A4	<1	<0.20	<0.05
A5	<1	<0.20	<0.05
A6	<1	<0.20	<0.05
A7	<1	<0.20	<0.05

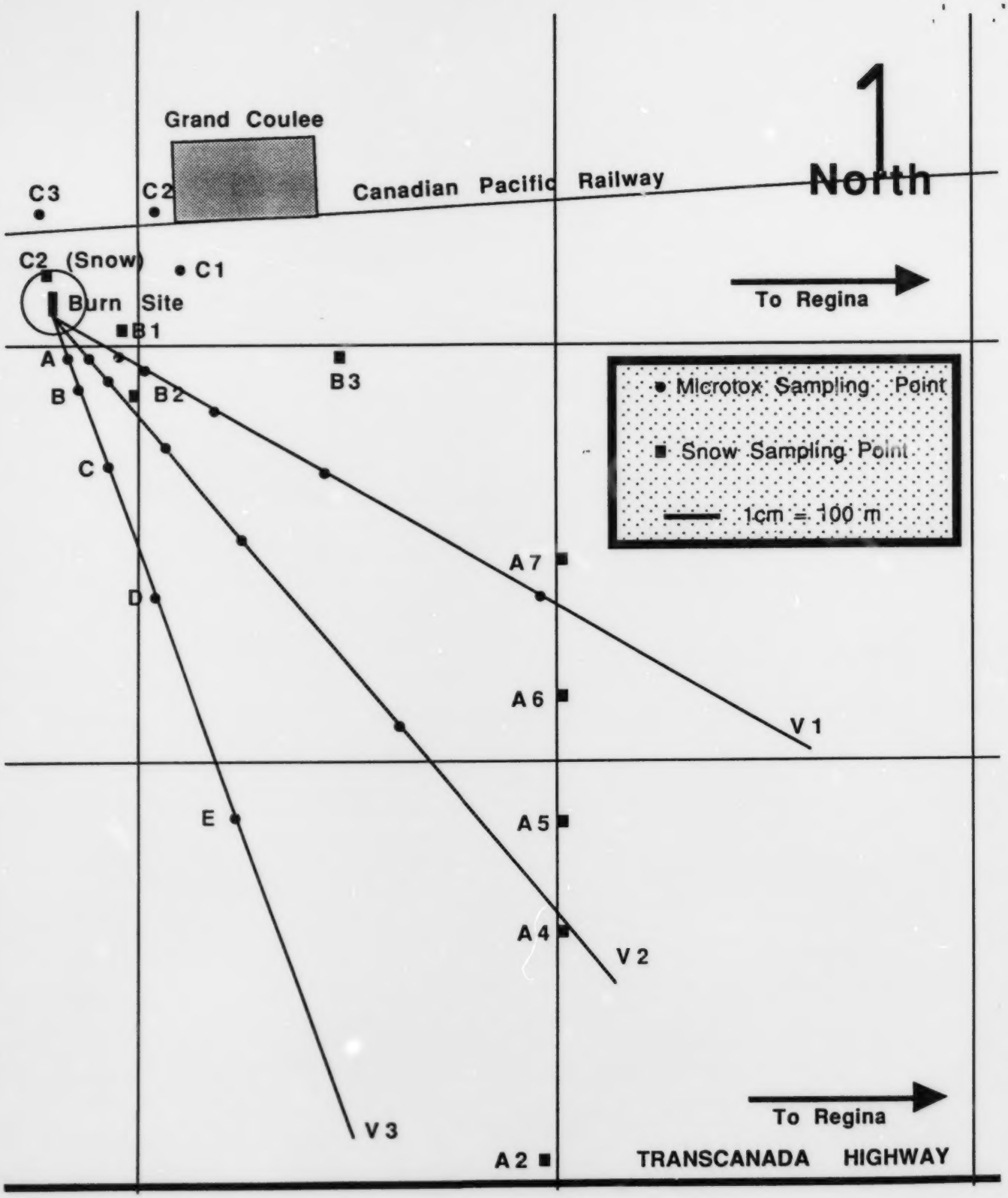
Yards Immediately Downwind

	Cyanides	Herbicides	Pesticides
B1	<1	<0.20	<0.05
B2	2	*20	<0.05
A5	<1	<0.20	<0.05

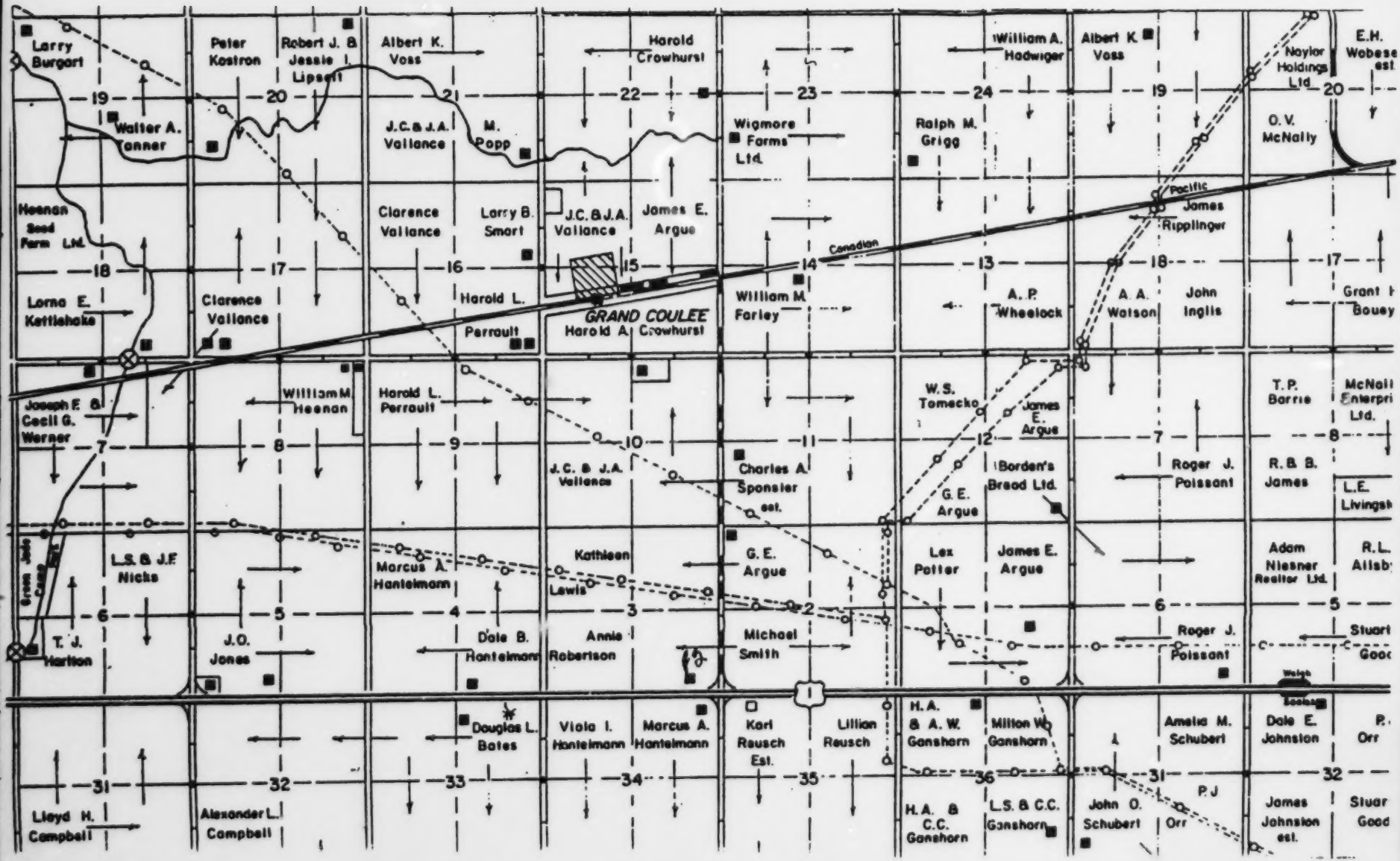
Ash Samples

	Cyanides	Herbicides	Pesticides
Warehouse	<0.1	<0.05	<0.05
Workshop	<0.7	<0.05	<0.05

* Concentration given (20 µg/l) is for 2,4 - D. The rest of the herbicides are less than 0.20 µg/l



Representational Diagram of Sampling Points
(approximate)


Larry Burgart
Walter A. Tanner
Peter Kostron
Robert J. & Jessie I. Lipsett
Albert K. Voss
J.C. & J.A. Vallance
M. Popp
Harold Crowhurst
Wigmore Farms Ltd.
William A. Hadwiger
Albert K. Voss
Ralph M. Grigg
Naylor Holdings Ltd.
E.H. Wobese est.
O.V. McNally
Heenan Seed Farm Ltd.
Lorne E. Kettleshake
Clarence Vallance
Larry B. Smart
J.C. & J.A. Vallance
James E. Argue
Harold L. Perrault
GRAND COULEE
Harold A. Crowhurst
William M. Farley
Canadian Pacific
James Ripplinger
A.P. Wheelock
A.A. Watson
John Inglis
Grant Bouey
Joseph F. & Cecil G. Werner
William M. Heenan
Harold L. Perrault
J.C. & J.A. Vallance
Charles A. Sponsler est.
W.S. Tomecko
James E. Argue
Borden's Bread Ltd.
G.E. Argue
Roger J. Poissant
T.P. Barrie
McNall Enterpri Ltd.
R.B.B. James
L.E. Livingst
L.S. & J.F. Nicks
Marcus A. Hantelmann
Kathleen Lewis
G.E. Argue
Lex Potter
James E. Argue
Adam Niesner Realtor Ltd.
R.L. Ailsb
T.J. Harlton
J.O. Jones
Dale B. Hantelmann
Annie Robertson
Michael Smith
Roger J. Poissant
Stuart Good
Douglas L. Bates
Viola I. Hantelmann
Marcus A. Hantelmann
Karl Reusch Est.
Lillian Reusch
H.A. & A.W. Ganshorn
Milton W. Ganshorn
Amelia M. Schubert
Dale E. Johnston
P. Orr
Lloyd H. Campbell
Alexander L. Campbell
H.A. & C.C. Ganshorn
L.S. & C.C. Ganshorn
John O. Schubert
P.J. Orr
James Johnston est.
Stuar Good

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: fb-2
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Field Blank of Sample Wipe
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: blank run to test compounds present in wipe, solvent and bottle

MEANING OF ANALYTICAL RESULTS: *wipes have bacteriacide in them at ppm level this can be compensated for*

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER	fb-1
SAMPLE TYPE	Surface Wipe
WHERE SAMPLE TAKEN	Field Blank of Sample Wipe
DATE SAMPLE TAKEN	Nov. 23, 1991
SAMPLE DESCRIPTION	blank run to test compounds present in wipe, solvent and bottle
MEANING OF ANALYTICAL RESULTS	*wipes have bacteriacide in them at ppm level this can be compensated for*

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED	Nov. 24
ANALYST	Ken Li and Tim Caron
Data Checked by	Jocelyn Paré and Merv Fingas
Date prepared	November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER	5
SAMPLE TYPE	Surface Wipe
WHERE SAMPLE TAKEN	Michel Smith Farm - Outside window
DATE SAMPLE TAKEN	Nov. 23, 1991
SAMPLE DESCRIPTION	wipe on outside window Smiths not home window facing North
MEANING OF ANALYTICAL RESULTS	*results show no chemical contamination*

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED	Nov. 25
ANALYST	Ken Li and Tim Caron
Data Checked by	Jocelyn Paré and Merv Fingas
Date prepared	November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 10
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Karl Reusch - Outside window
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on outside window
window facing North

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*

low peaks - none identified as pesticide residues

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
some		?		ppb

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 18
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Douglas Bates Farm - outside window
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on outside window facing North toward site

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*

no pesticide residues appear to be present like at other farms in area

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 1
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Dale Hantelman - kitchen floor wipe
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on kitchen floor 10:15 am

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*
few peaks probably due to floor war compounds
none identified as pesticide residues

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
		floor war compounds ?		

DATE ANALYSED: Nov. 25
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER	3
SAMPLE TYPE	Surface Wipe
WHERE SAMPLE TAKEN	**Dale Hantelman - Outside window**
DATE SAMPLE TAKEN	Nov. 23, 1991
SAMPLE DESCRIPTION	wipe on outside window window facing North
MEANING OF ANALYTICAL RESULTS	***results show no chemical contamination***
	low peaks - none identified as pesticide residues

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED	Nov. 25
ANALYST	Ken Li and Tim Caron
Data Checked by	Jocelyn Paré and Merv Fingas
Date prepared	November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 15
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: **A. Ganshorn - outside window wipe**
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on outside window
west window facing fire

MEANING OF ANALYTICAL RESULTS: ***results show no significant chemical contamination***
number of peaks probably due to residual pesticides and some to fuels

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
1	3.82	?	possibly fuels	ppm
2	3.96	?	possibly fuels	ppm
3	10.41	?	possibly fuels	ppb
4	10.6	phthalate compounds	plastic residues	ppb
5	18.34		part of blank wipe	ppm

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 11
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Ganshorn - kitchen floor wipe
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on kitchen floor 11:20 am

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*
number of peaks probably due to floor war compounds
none identified as pesticide residues

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
several		floor war compounds ?		

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 16
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: Marcus Hantelman Farm - kitchen floor wipe
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on kitchen floor

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
several		floor wax compounds		

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER	8
SAMPLE TYPE	Surface Wipe
WHERE SAMPLE TAKEN	Marcus Hantleman Farm - outside window
DATE SAMPLE TAKEN	Nov. 23, 1991
SAMPLE DESCRIPTION	wipe on outside basement window facing North toward site
MEANING OF ANALYTICAL RESULTS	*results show no serious chemical contamination some pesticide residue present, but this is not necessarily from those stored in warehouse residues are at very low levels and reflect background levels of blow dust*

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL
1	6.7	Hexachloro ethane	pesticide residue	ppb
2	7.2	2-ethyl hexanoic acid	pesticide residue	ppb
3	14.2	bis (2-methoxyethyl) 1,2-Benzenedicarboxylic acid	plastic brk. product	ppb
4	23	2-ethylhexyl diphenyl ester phosphoric acid	pesticide residue	ppb

DATE ANALYSED	Nov. 24
ANALYST	Ken Li and Tim Caron
Data Checked by	Jocelyn Paré and Merv Fingas
Date prepared	November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

GRAND COULEE CHEMICAL WAREHOUSE FIRE

ANALYSIS OF SAMPLES

SAMPLE NUMBER: 14
SAMPLE TYPE: Surface Wipe

WHERE SAMPLE TAKEN: A. Ganshorn - Outside window
DATE SAMPLE TAKEN: Nov. 23, 1991
SAMPLE DESCRIPTION: wipe on outside window
window facing North (note- a west and north window were done)

MEANING OF ANALYTICAL RESULTS: *results show no chemical contamination*

low peaks - none identified as pesticide residues

PEAKS DETECTED OTHER THAN THE BLANKS

PEAK	RT	COMPOUND	DESCRIPTION	LEVEL

DATE ANALYSED: Nov. 24
ANALYST: Ken Li and Tim Caron
Data Checked by: Jocelyn Paré and Merv Fingas
Date prepared: November 26, 1991

Emergencies Science Division - Environment Canada
Ottawa, Ontario

SRC Group: 91-3520
RUSH

27-Nov-91 13:47

SASKATCHEWAN RESEARCH COUNCIL
ANALYTICAL SERVICES

Saskatchewan Environment & Public Safety
Air & Land Protection Branch
3085 Albert Street
Regina, Saskatchewan S4S 0B1
Attn: Ash Olesen

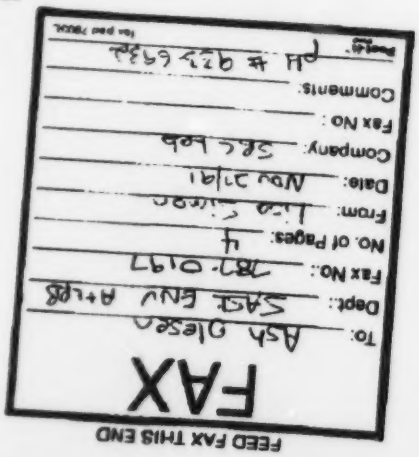
Date Samples Received: 21-Nov-91 Client P.O.: Grand Coulee Samples

SAMPLE	CLIENT DESCRIPTION
16731	A-2 WEST OF INTERSECTION (NOV 21/91) *SNOW*
16732	A-4 1000 M NORTH (EAST SIDE) *SNOW*
16733	A-5 1500 M NORTH (EAST SIDE) *SNOW*

ANALYTE	UNITS	ESQUA#	16731	16732	16733
TRACE CONSTITUENTS					
Cyanide, total	ug/L	06601P	<1	<1	<1
GLC					
Herbicides PFBB	ug/L	no-val	<0.20	<0.20	<0.20
Pesticides	ug/L	18199P	<0.05	<0.05	<0.05

SAMPLE	CLIENT DESCRIPTION
16734	A-6 2000 M NORTH (EAST SIDE) *SNOW*
16735	A-7 2500 M NORTH (EAST SIDE) *SNOW*
16736	B-1 *SNOW*

ANALYTE	UNITS	ESQUA#	16734	16735	16736
TRACE CONSTITUENTS					
Cyanide, total	ug/L	06601P	<1	<1	<1
GLC					
Herbicides PFBB	ug/L	no-val	<0.20	<0.20	<0.20
Pesticides	ug/L	18199P	<0.05	<0.05	<0.05



SASKATCHEWAN RESEARCH COUNCIL
ANALYTICAL SERVICES

Saskatchewan Environment & Public Safety

SAMPLE	CLIENT DESCRIPTION
16737	B-2 *SNOW*
16738	B-3 EAST OF FACILITY *SNOW*
16739	C-1 W.S.B. *SNOW*

ANALYTE	UNITS	ESQUA#	16737	16738	16739
TRACE CONSTITUENTS					
Cyanide, total	ug/L	06601P	2	<1	<1
GLC					
Herbicides PFBB	ug/L	no-val	20	---	
Pesticides	ug/L	18199P	<0.05	<0.20	<0.20
				<0.05	<0.05

SAMPLE	CLIENT DESCRIPTION
16740	C-2 *SNOW*

ANALYTE	UNITS	ESQUA#	16740
TRACE CONSTITUENTS			
Cyanide, total	ug/L	06601P	21
GLC			
Herbicides PFBB	ug/L	no-val	<0.20
Pesticides	ug/L	18199P	<0.05

#16737 Herbicides PFBB: The concentration given (20 ug/L) is for 2,4-D. The rest of the herbicides are less than 0.20 ug/L.

SASKATCHEWAN RESEARCH COUNCIL
ANALYTICAL SERVICES

Saskatchewan Environment & Public Safety
Air & Land Protection Branch
3085 Albert Street
Regina, Saskatchewan S4S 0B1
Attn: Ash Olesen

Date Samples Received: 21-Nov-91 Client P.O.: Grand Coulee Samples

SAMPLE	CLIENT DESCRIPTION
16741	#1 ASH FROM WAREHOUSE NOV 21/91 *ASH*
16742	#2 ASH FROM WORKSHOP NOV 21/91 *ASH*

ANALYTE	UNITS	ESQUA#	16741	16742
TRACE CONSTITUENTS				
Cyanide, total	ug/g	06611L	<0.1	0.7
GLC				
Herbicides PFBB	ug/g	no-val	<0.05	<0.05
Pesticides	ug/g	no-val	<0.05	<0.05

The list of the herbicides and pesticides determined in the snow and ash samples are as below:

Herbicides: Dicamba, 2,4-D, Silvex, 2,4,5-T, 2,4-DB, Picloram.

Pesticides: alpha-BHC, beta-BHC, Lindane, Heptachlor, Aldrin, Heptachlor epoxide, Dieldrin, Endrin, DDT (total isomers), Trifluralin, Avadex BW, Stampede, Lorsban, Buctril, Hoegrass.

SRC Group: 91-3520 (samples 16731 to 16742)27-Nov-91 13:51 Page 1
RUSH

SASKATCHEWAN RESEARCH COUNCIL
ANALYTICAL SERVICES

15 Innovation Blvd.
Saskatoon, Saskatchewan S7N 2X8
(306) 933-6932

(Summary of charges: not an invoice)

Saskatchewan Environment & Public Safety
Air & Land Protection Branch
3085 Albert Street
Regina, Saskatchewan S4S 0B1
Attn: Ash Olesen

Date Samples Received: 21-Nov-91 Client P.O.: Grand Coulee Samples

No. of Detn's	Analyte Description	Unit Charge	No. of Detn's	Analyte Description	Unit Charge
10	Cyanide, total	29.50	2	Cyanide, total	29.50
2	Herbicides PFBB	185.00	10	Herbicides PFBB	120.00
10	Pesticides	73.00	2	Pesticides	145.00

Analyte Charge Subtotal = $2944.00

RUSH Surcharge = $1472.00

Less 15% = $662.40

TOTAL = $3753.60

This summary of charges does not include the 7% GST. It will be added to the invoice if applicable.

APPENDIX 10.4

PRELIMINARY SITE ASSESSMENT
GRAND COULEE CHEMICAL FACILITY - MERV FINGAS

Extent of Contamination

Because of the absence of detailed laboratory results, the exact extent is not known. Evidence of coloration and from the microtox testing indicates that any contamination of concern is probably confined to the Perrault property. Much of this is readily cleanable.

There is not at this time evidence that significant amounts of toxins, be they pesticides, pesticide breakdown products or pesticide combustion products or any other chemicals have left the Perrault property. No analytical results are available at the time of writing. This is based on visual observations on exterior structures on properties downwind as far as 12 Kms. No soot or colorations indicative of pollution have been observed.

Discoloration of soil adjacent to the warehouse and some splotches on soil and on the utility pole on the Perrault property indicate contamination by Supracide or Lazer (red) and by Treflan (Yellow). This is not severe and can be removed.

The warehouse is relatively free of residues and unburnt chemicals. In fact, there are ares where it is clear that there is none if any contamination. All this awaits chemical analysis of the little residue that was found. Only two areas exist where tarry residue was found - both residues were removed to the extent possible as laboratory samples.

Priority Areas for Investigation

The warehouse was given a preliminary assessment as to the extent of burned-off material and presence of residues. Because access is restricted due to structural integrity and the corresponding safety concerns, three areas of concern were not fully assessed;

1. The north-east corner of the warehouse where bulk pesticides were stored. The outer drums are empty, but the drums just inside the wall are still inaccessible.

2. The two lab-pack or bulk drumming storage areas. These are the areas where the school chemicals were stored. The drums appear to be integral, but whether they are or not is not known. This could only be determined by opening each drum.

3. The fate of the material in the North-west corner. This material - not of high priority is entirely covered with vermiculite.

Priority Cleanup Suggested

1. Cleanup of the area directly in front of the shed and the spots outside the "hot zone". This, I believe, can be done using a stiff broom (stable broom) and a flat shovel. This is important to prevent recontamination of the material about the site by inadvertent tracking as a result of foot traffic.

2. Cleanup of the area around the warehouse by the same method as suggested above. This is necessary for the above reason, but also so that utilities can be connected to the tool shed for its use a control centre. The area on the west side of the warehouse is at most 2 metres, on the north 4 metres and on the east extends out to 18 metres. The latter is clearly visible as red contamination on soil and on the stubble. Some yellow contamination also exists.

3. Clean up of the shack. This is best done by using dry rages at first followed by soap and water. The floor should then be swept and washed with soap and water. Dry cleaning is first used because the soot and residue may not be water soluble. The shack should be aired for a period not less than six hours before occupying without respirators.

   After inside cleaning, the shack should be washed outside - as best as possible - with a heavy soap, water solution and brush.

4. Clean up of the warehouse can then begin. A priority should be placed on capping the warehouse with a temporary plastic shelter so that snow does not compound the cleanup activity both by hiding the scene, but also by adding to the volume of material.

5. It is important that all of the above proceed as quickly as possible so that new snow does not compound the difficulty of cleanup.

6. The prime danger of contamination from the site now consists of material transport on boots. It is important that the boot-washing facility now in place be maintained until all of the ground contamination has been cleaned. All cleanup should be performed with organic cartridge respirators - a combination cartridge is preferred. Also necessary are steel capped and soled rubber (butyl) boots, disposable outer garments, and disposable gloves. Gloves and garments are disposed of upon exit of the dangerous zone. Cartridges on respirators should be changed at lease every two days.

7. The first part of the warehouse cleanup should consist of a removal of non-relevant debris and structural obstructions. These can be decontaminated using a pressure wash with soap. All water should be caught and treated.

8. After removal of obstructions cleanup of chemicals can proceed. Most drums still containing materials can be packaged in over-packs and disposed of as was the intent with the starting material. The floor of the warehouse should only require special washing in those regions where pesticides were stored. This could consist of repeated washing with solvent such as varsol and final washing with several soapy water washes. Tests should be made of the penetration depth of the material in the concrete to ensure that any material is removed. At this time there does not appear to be any evidence of any penetration of liquid or semi-liquid material. Only a few millilitres of this material has been bound and it was removed as a sample.

9. Waste drums are needed on the site as soon as possible to receive the cleanup materials.

10. The high hazard zone can remain the same as now marked.

Implications of Future Sample Results

The samples currently under analysis will have implications for the site assessment and cleanup:

1. The determination of whether pesticides, residues, combustion products and other chemicals were carried off site and to what extent.

2. The presence and amount of these same substances in the houses downwind of the site.

3. The contents of the various ash and soil residues on the warehouse site.

4. The presence of any other materials that may not have been noted in the inventories.

It is felt at this time that analytical results will not significantly change the site assessment nor the cleanup recommendations.

Overall Assessment

The Situation at the Grand Coulee facility is not as serious as first feared. The fire was complete and resulting in very little residue. Some chemical was released as a result of spray after BLEVE's. This spray is largely unburned

because of lack of opportunity and because of its high velocity of release.

It is felt, on the basis of preliminary observations, that chemical contamination does not exist past the property on which the facility was located.

Clean up will be relatively straight forward and economical because of the above situations.

Analysis of samples continues, but results should not significantly affect either the assessment or the clean up results.

Reports of smells and smoke observations are in most cases collaborated. Smells are not necessarily indication of high chemical contamination because some of the pesticides have very low odour thresholds.

Preliminary

Merv Fingas, November 25, 1991

Government of Saskatchewan
Information Services

Legislative Building
Regina, Canada
S4S 0B3

(306) 787-6281

News Release

IMMEDIATE RELEASE
Nov. 21, 1991

Saskatchewan

Environment and Public Safety 91-620

TWO-MEMBER BOARD OF INQUIRY APPOINTED INTO GRAND COULEE FIRE

A two-member board of inquiry into last night's fire at the Grand Coulee chemical storage site has been appointed, Environment and Public Safety Minister Carol Carson announced today.

The commission will be made up of Randy Sentes, assistant deputy minister of Saskatchewan Environment and Public Safety, and Rick McCulloch, provincial fire commissioner.

Carson said an investigation into the fire has already begun and is continuing. She said the inquiry will report to her and to the public as soon as possible.

The minister stressed the environment department feels the site is not a threat to the health of Saskatchewan people. She said the results of any testing will, of course, be made available to the public.

Carson said the two officials have a four-point directive for its inquiry:

* Determine what happened, how the fire started, what was in the warehouse, and how efficiently the emergency response system worked.

* Conduct an environmental assessment of the damage which may have been done, short-term and long-term, as a result of the fire.

Recycled Paper

.....2

* Evaluate the agricultural chemical collection program, to see if the collection, transportation and storage of waste chemicals is being done in the best possible manner.

* Make any recommendations for future control procedures which might be useful to ensure such a situation does not arise again.

Carson said Saskatchewan Environment still does not know what caused the fire. She said the building did not have a fire alarm system, that it was not placarded as a hazardous waste storage site, and that it was not fenced.

"I expect this inquiry to tell me why these precautions were not taken, and if they were a contributing factor to last night's situation," she said.

The minister said analysis of snow samples is being done and results will be available in a few days. "We feel quite secure, however, in saying there is likely no residual danger at the site. Nor do we believe that the toxicity level of the smoke last night was of a major proportion."

Carson stressed the department feels the site is not a threat to the health of local residents. But she said it is the department's duty to ensure that the public is protected.

-30-

Contact:

John Millar
Cabinet Press Secretary
Regina

Phone: 787-1904

Government of Saskatchewan
Information Services

Legislative Building
Regina, Canada
S4S 0B3

(306) 787-6281

News Release

IMMEDIATE RELEASE
Nov. 22, 1991

Saskatchewan

Environment and Public Safety 91-625

ENVIRONMENT CANADA TO HELP WITH GRAND COULEE FIRE INVESTIGATION

Environment Canada is co-operating with Saskatchewan Environment and Public Safety to assess and clean up the chemical fire at Grand Coulee.

Inquiry team members Randy Sentis and Rick McCullough said Environment Canada has offered specialist services to determine the extent of contamination of the site, if any, prior to the fire commissioner expanding his investigation on to the site.

Federal assistance includes sending a trained expert from Ottawa to undertake on-site sampling and analyses. These procedures will characterize the chemical dispersal patterns in the immediate area of the fire. The individual will also advise on-site entry and cleanup management, including debris removal.

In addition, Environment Canada will provide an on-site mobile laboratory and a technician to screen samples for contaminants.

Crews from both federal and provincial environment departments will work over the weekend to determine the fire's impact.

-30-

For further information, contact

Randy Sentis
Environment and Public Safety
Regina

Phone: 787-6167

Rick McCullough
Provincial Fire Commissioner
Regina

Phone: 787-3566

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Government of Saskatchewan
Information Services

Legislative Building
Regina, Canada
S4S 0B3

(306) 787-6281

News Release

IMMEDIATE RELEASE
Nov. 27, 1991

SASKATCHEWAN

Environment and Public Safety 91-635

MINIMUM CONTAMINATION FROM GRAND COULEE FIRE

Preliminary results of monitoring tests taken following the fire at the chemical transfer facility near Grand Coulee show no off-site contamination.

An inquiry team appointed by Environment and Public Safety Minister Carol Carson has received results on soil and snow samples taken from the area of potential pollution, and from tests of neighboring farm houses.

The only pollution discovered was a low level of pesticide found at the immediate site of the fire, within 50 metres of the facility.

Analysis by Environment Canada experts at an on-site mobile laboratory determined the site was safe enough for the fire investigation to begin. The inquiry team will present an interim report to the minister by Nov. 29.

-30-

For further information, contact:

Randy Sentis
Environment and Public Safety
Regina

Phone: 787-6167

Rick McCullough
Provincial Fire Commissioner
Regina

Phone: 787-3566

Recycled Paper

Saskatchewan
Environment and
Public Safety

Walter Scott Building
3085 Albert Street
Regina, Canada
S4S 0B1

November 22, 1991

Dear Grand Coulee and Area Resident:

We are writing to provide you with some information about the fire that occurred in the chemical storage building near Grand Coulee two days ago.

Here are some points that should help answer questions you might have:

Background on the Facility:

* The building was being used as a transfer site for farm chemicals that had been collected under the province's Agricultural Chemical Collection Program.

  The purpose of that program is to collect from farmers pesticides that are too old to use or are deregistered. These chemicals are repackaged and stored until they are shipped to special facilities out of the province that dispose of them in an environmentally safe manner.

  We have enclosed a brochure on the Agricultural Chemical Collection Program that provides more details on the program.

* At the time of the fire, nearly all of the chemicals collected in the 1991 season had been shipped out. What remained was enough for one last truck load; and those chemicals were being packaged for shipping out of province.

* Environment and Public Safety has a full list of all chemicals stored there, and had advised the local fire department of the building's contents.

* Local municipal governments knew, at all times, what the facility was used for and that it was inspected regularly by Environment and Public Safety officials.

Cause of the Fire:

* We still do not know the cause of the fire. For that we must await the Fire Commissioner's investigation, a part of the overall investigation.

Future Reports:

* We will provide an interim report on the investigation so far by Friday, November 29.

* The final report on the investigation will be made available as soon as the investigation has been completed.

Immediate Effects:

* At this point, we feel that there is no residual danger at the storage site and that there is no threat to the health of local residents. However, we have secured the technical assistance to confirm this.

Recycled Paper

What the Environment Department is Doing:

* On the night of the fire, the Minister of Environment and Public Safety appointed us as the investigation team. Our job is to:

    1. Determine what happened, how the fire started, what was in the warehouse, and how efficiently the emergency response system worked;

    2. Conduct an environmental assessment of the damage which may have been done as a result of the fire;

    3. Hire an independent consultant to evaluate the Agricultural Chemical Collection Program to see if the collection, transportation and storage of waste pesticides is being done in the best possible manner; and

    4. Make any recommendations for future control procedures that might be useful to ensure such a situation does not arise again.

* The federal environment department is co-operating in the investigation. They are sending a trained expert from Ottawa to undertake on-site sampling and analyses. This individual will also advise on site entry and clean-up management. Environment Canada is also sending from Edmonton its mobile "on-site" laboratory and a technician to screen samples for contaminants.

  Crews from both the federal and provincial environment departments are already at work and will continue throughout the weekend to determine the fire's impact.

* The results of any testing, and all reports will be made available to the public. We will keep you fully informed as to when the reports have been completed and how you can obtain one.

The Minister of Saskatchewan Environment and Public Safety has made it very clear that the purpose of this investigation is to prevent this kind of situation from arising again.

We encourage you to call us. Our phone numbers are listed below. Please call weekdays, from 8:00 a.m. to 5:00 p.m. If you need information over the weekend, please call 1-800-667-7525 and your call will be referred to us

Yours sincerely,

Randy Sentis,
Assistant Deputy Minister
Saskatchewan Environment and Public Safety
787-6167

Rick McCullough,
Provincial Fire Commissioner
Saskatchewan Community Services
787-3566

Saskatchewan

Saskatchewan
Environment and
Public Safety

Walter Scott Building
3085 Albert Street
Regina, Canada
S4S 0B1

November 26, 1991

Dear Grand Coulee and Area Resident:

We are writing once again to give you an update on the fire that occured in the chemical transfer facility near Grand Coulee on November 20.

Since we last wrote you, officials from Saskatchewan Environment and Public Safety and from Environment Canada have taken snow and soil samples in the areas surrounding the building, in farm yards down wind of the fire and within Grand Coulee. The samples from the down wind area and the immediate fire site have been analyzed, and we are happy to share the results with you:

- There was no contamination found in samples taken from farm yards down wind of the fire.
- There are low levels of pesticide contamination near the site of the fire.
- We are still awaiting results from samples taken in Grand Coulee. However, at this time, we every reason to believe that these sample results will be as good as those taken down wind of the fire site.
- By Saturday afternoon analyses at the fire site undertaken by Environment Canada experts in the on-site mobile laboratory had determined that the site was safe enough for the fire investigation to procede. The investigation began immediately and is continuing.
- We will make our interim report to the Minister of Environment and Public Safety on Friday, November 29. Copies of the report will be made available to you.

Please call us if you have any questions or concerns. Call weekdays, from 8:00 a.m. to 5: p.m. Our phone numbers are listed below.

Yours sincerely,

Randy Sentis,
Assistant Deputy Minister
Saskatchewan Environment and Public Safety
787-6167

Rick McCullough,
Provincial Fire Commissioner
Saskatchewan Community Services
787-3566

A Healthy Environment
is Everyone's Responsibility

Recycled Paper

Saskatchewan

Saskatchewan
Environment and
Public Safety

Walter Scott Building
3085 Albert Street
Regina, Canada
S4S 0B1

November 28, 1991

Dear Grand Coulee and Area Resident:

We are pleased to provide you with a copy of our Interim Report on the Investigation into the Grand Coulee Fire. The report will be released to the pubic tomorrow morning.

The report:

- includes information on all activities that occurred on the night of the fire and in days following;
- outlines environmental and fire investigation priorities;
- confirms that the fire resulted in no off-site contamination; and
- confirms that we have contracted an independent consultant to study the storage, transportation and handling of waste chemicals in Saskatchewan.

The investigations will continue, and we expect to make our final report in December.

Once again, we encourage you to call us with your questions and concerns at the phone numbers listed below. Please call weekdays during office hours.

Yours sincerely,

Randy Santis,
Assistant Deputy Minister
Saskatchewan Environment & Public Safety

787-6167

Rick McCullough
Provincial Fire Commissioner
Saskatchewan Community
Services
787-3566

A Healthy Environment
is Everyone's Responsibility

Acid-free Paper